RESPONSE AND REQUEST FOR RECONSIDERATION

Support. Support for the ratio of 1.6 to 2.5 moles acid per 1 mole of aminoalcohol is found on page 4 at line 9. Support for the presence of dispersant in claim 12 is found in original claim1.

Response.

The present invention relates to a method for lubricating a transmission or related devices, by supplying a fluid composition which contains a dispersant and a friction modifier which is the reaction product of a carboxylic acid and an amino alcohol. The components for the reaction product are selected such that the product contains approximately two branched chain alkyl groups, each having at least about 6 carbon atoms. In order to provide two such alkyl groups, the acid (which typically will provide the branched chain alkyl group) and the aminoalcohol are reacted in a mole ratio of approximately 2:1, that is, 1.6~2.5:1. The reaction product of 2:1 is superior to the products of either 1:1 or 3:1 in terms of providing a combination of high static friction (μT) and a positive slope on the JASO M-348-95 test.

Compositions with the present benefits are not disclosed in the cited references. Koch (US 4,479,888) was cited as anticipatory of claims 1, 2, 4, 6, and 7. Since Koch was not cited against the subject matter of claim 12, it is believed that this reference is not applicable to the claims as presently amended.

Certain of the claims, but not claim 12, were also rejected as made obvious by Higaki (US 4,886,612) in view of Papay (US 5,652,201). It is thus believed that this combination of references is not pertinent to the claims as presently amended.

Certain claims, including the method claim 12, were rejected as made obvious by a combination of Chung (US 5,244,590) in view of Higaki.

Chung discloses a dispersant-viscosity index improver which can be used in lubricating oils and fuel compositions. The claimed products may be used in a variety of lubricants such as those conventionally employed as crankcase lubricating oils, power transmitting fluids (e.g., automatic transmission fluids) as well as gear lubricants, industrial oils, pump oils, and other lubricating oil compositions (col. 55 l. 65 – col 56 l.9). Chung also discloses other conventional additives which may be used along with his dispersant-viscosity modifiers. He mentions that friction modifiers may be used to impart the proper friction characteristics to lubricating oil compositions such as automatic transmission fluids (col. 30 line 48-50). Chung separately mentions that dispersants may be used to maintain oil insolubles, resulting from oxidation during use, in suspension to prevent sludge flocculation and precipitation or deposition on metal parts. It should be noted that Chung does not teach that dispersants should be used

together with friction modifiers in automatic transmission fluids. Indeed, oxidation, sludge, and deposit formation are particularly problems of engine crankcase lubricants, resulting from the reaction of combustion byproducts with the lubricant. Transmission fluids, on the other hand, operate in a clean environment and are not exposed to combustion byproducts. Therefore, oxidation and sludge is not normally a problem in transmission applications. The person skilled in the art would recognize that Chung's teaching of the use of dispersants would be applicable specifically to engine lubricants.

Along these lines, it should be stressed that dispersants are used in the present invention for an entirely different purpose from anything relating to crankcase lubricant technology. They are used as a part of a package with carefully balanced friction requirements such as high friction and retention of a positive slope in the mu/v curve (paragraph 0002). They are used to help provide a proper balance of friction properties, not to control sludge.

Moreover, there is no disclosure in Chung of the specific friction modifiers of the present claims nor of their use in an automatic transmission or the like, either alone or together with a dispersant.

The secondary reference, Higaki, does not remedy these defects. Higaki discloses condensates of amino alcohols with various fatty acid such as isostearic acid for use in a lubricant. As was mentioned in the previous response, the lubricating oils of Higaki are "metal plastic processing" lubricants, that is, they are designed principally for metal cold rolling, cutting, drawing, or pressing (col. 1 lines 10-13). There is only passing mention that they may be used for other applications such as spinning of synthetic fibers or as lubricating oils for internal combustion engines. There is no mention of transmission fluids. The lubricant of Higaki is principally designed for applications involving the deformation or cutting of metals. This is remote from the application of the present invention, which involves lubrication of a transmission, tractor, gearbox, or bearing. All of these use metals in a non-destructive manner, and all of their lubricants are exposed to a significantly different environment and have very different performance requirements from that of metal processing fluid or even than a crankcase lubricant.

Moreover, the present claims describe the condensation product as made by reacting 1.6 to 2.5 moles acid with 1 mole of aminoalcohol. This is different from the ratio of 2.8 disclosed in Higaki. Sample A of Higaki is prepared using this ratio of 2.8, for instance, and the products is described, in Table 1, as having three groups, R_1, R_2, and R_3, all being isostearic acid alkyl residual groups. There is no reason, based upon Higaki, to select the presently claimed lower ratios of reactants.

Moreover, as the examiner has noted, Higaki discloses his compounds for use as base lubricants and not as additives, although they may be blended with other oils. The Examiner has pointed out that Higaki's compounds have friction reducing properties when blended with a mineral oil (see Table 6). In contrast, the friction modifier (a) of the present invention is particularly employed to provide a high, stable coefficient of friction in a transmission fluid with a favorable ratio of static coefficient of friction:dynamic coefficient, as described in the present Examples section. There is no reason to expect that any such desirable results would be achieved by Hikagi's use of his different materials as a base oil composition (100%) or even at 30% or 10% levels as in his Table 6 or Table 11. These levels, incidentally, are far outside the amounts set forth in, for example, claim 9 of the present invention (0.2 to 5%).

Finally, there is no disclosure in Higaki of the use of a dispersant. As has been stated above, dispersant are typically used for crankcase lubricants and the like, to disperse sludge and to prevent deposit formation. Therefore, there is no reason, based on Chung or Higaki, alone or in combination, to use a dispersant along with the selected friction modifiers of component (a), to provide a formulation with carefully balanced friction properties, suitable for use as an automatic transmission fluid.

Accordingly, it is submitted that the present invention is not made obvious by a combination of Chung with Higaki.

The remaining cited reference, Ichihashi, was applied only in connection with original claim 5, which has now been amended to refer to claim 12. Accordingly, it is believed that the subject of this claim is also unobvious and no further remarks are required.

Conclusion.

For the foregoing reasons it is submitted that the present claims are novel, unobvious, and in condition for allowance. The foregoing remarks are believed to be a full and complete response to the outstanding office action. Therefore an early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the Undersigned is suggested.

Any required fees or any deficiency or overpayment in fees should be charged or credited to deposit account 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

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